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AIR FORCES

GOOD PREFLIGHT PREPARATION OF EQUIPMENT STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 7, 1981 (signed to press 2 Jun 81) pp 1-3

[Article by Colonel General of Aviation S. Golubeyev, Hero of the Soviet Union, USSR Honored Military Pilot: "New Equipment, New Norms"]

[Text] Day was breaking over the air base. Suddenly the long blast of a siren split the morning silence. Within only a few minutes everything was in motion. In accordance with their established schedule, personnel of the squadron commanded by Lieutenant Colonel A. Marenkov formed up at their assembly points and moved off in formation to the air field. The aircraft parking area was soon a beehive of activity. Technicians and mechanics were quickly and skillfully preparing the aircraft and helping the aircraft armament specialists mount their ammunition. A short time later the aviators arrived at their aircraft and set immediately to work. Reports on crew readiness for takeoff began to come in to the command post. Just as the last crew reported in, the command post gave the command "Vozdukh" [Air].

The combat aircraft taxied out onto the runway in their assigned order and then at specified intervals streaked into the sky. When the last aircraft lifted off from the runway the monitor stopped his stopwatch. From the moment the "Sbor" [Assemble] signal was given until the last crew took off, the squadron used much less time than allowed by norm. This was a success for the entire military collective and a result of the great and painstaking labors of command personnel and party and Komsomol organizations directed toward developing in these men a deep awareness and sense of personal responsibility for improving the combat readiness and efficiency of their sub-unit [podrazdeleniye].

The experience of past wars has demonstrated that surprise--the most important principle of the military art--has always played a decisive role in the successful development of a military operation. The time factor in this instance was for both of the opposing sides not only a quantitative, but a qualitative indicator of the level of their troop training as well. The one able to detect enemy preparations for attack first had been able to anticipate his actions, take the necessary countermeasures, prepare his own forces to repel the attack and then organize active counteraction. This last response had been made possible by good knowledge of the capabilities of the weapons and equipment at the enemy's disposal and of the methods and techniques of their combat employment, constant vigilance with an eye to aggressive intentions and devices of the enemy and by a high degree of combat readiness on the part of one's own forces.

With today's advances in the development of means of armed combat, surprise is of continuously growing importance. Aviation and both ground and naval forces are now highly mobile; they have great maneuverability and dispose of powerful weapons to serve a variety of combat needs, which allows the employment of those combat operational methods and procedures making a surprise attack possible. The importance of the time factor is, accordingly, continuously increasing as well.

The time, quantitative and qualitative norms for the accomplishment of combat training tasks and execution of specific procedures and operations established for individual service members, subunits and units (chast') constitute objective indicators for a uniform method of evaluating the level of training of personnel and their readiness for combat. These norms are not established arbitrarily, but rather are developed taking into consideration combat training experience, special characteristics of the equipment and weapons employed and of their combat application, the conditions under which subunits are deployed as well as the season and time of day.

If, let's say, under absolutely identical conditions one subunit continually exceeds its norms while another is just barely able to meet them, this is evidence above all that personnel in the first military collective are more highly skilled, the troops are in a higher state of training, the combat training program is better organized and that this organization still has untapped potential at its disposal which, with proper exploitation, can substantially improve its level of combat readiness.

Norms applied to the preparation of aviation equipment and the performance of specific operations and procedures constitute, so to speak, visual indicators of the state of an aviator's training and of his moral and psychological preparedness to perform within strict time limits. At the same time they characterize the specific state of a man's combat readiness and efficiency. It would accordingly be wrong to look at these norms as something fixed and constant. Personnel, moreover, must search for potential remaining untapped, improve the methods they employ in their work, the procedures they use in performing their operational duties, and strive continuously to put to use every possible advance and innovation, which combat training experience makes possible. This is particularly important in the process of assimilating new aviation equipment and of training to operate new aircraft and helicopter models.

Not too long ago, squadron personnel began to assimilate new combat aircraft which are substantially different from those they had operated previously. Lieutenant Colonel A. Marenkov and his deputies and flight commanders gave clearly to understand that, despite the fact that the new aircraft was much more complex as far as its design was concerned and that preparing it for flights would require a great deal of attention on the part of all specialists, this by no means meant that norms applied to the process of bringing the subunit to a state of combat readiness would be raised. Quite the opposite was the case; more advanced hardware required reductions in the periods of time necessary to prepare it for combat operation. In a word, the difficulties would be considerable.

After receiving instruction in the theoretical aspects of the new machines and acquiring the necessary knowledge of their working principles and operation, flight personnel began operating the aircraft. They had to master new flying techniques and methods of combat employment; technicians and engineers had to develop the skills involved in preparing, checking, adjusting and repairing the systems and assemblies of the new

aircraft and work out new operating procedures, which would differ substantially from what they were used to. Experience accumulated during the early flights and drills conducted in bringing the subunit to a state of combat readiness showed that preflight preparation of equipment on board the aircraft now required less time since monitoring of its operating efficiency had now been automated; it took somewhat more time, on the other hand, to prepare its armament. On the whole, personnel experienced difficulty in meeting the norm requirements. This was telling evidence of inadequate knowledge and skill; there was a variety of objective and subjective factors involved here as well. Straining to work harder would be simply impossible. What people had to do was to rid themselves of their old habits entirely, change their methods of procedure and work out a new operating timetable.

Flight personnel, engineers, technicians and junior aviation specialists--all played an active role in developing the new norms; they offered practical suggestions concerning procedures involved in preparing equipment for flight operations and means of reducing the time required to do this. Each man felt a deep sense of personal responsibility before the collective for the results of his own work. The commander, political officer and squadron party activists continually focused the aviators' attention on the need for high quality performance of their daily tasks to the end of achieving their primary objective--to increase the subunit's combat readiness as quickly as possible and to make it combat efficient under any conditions. Special drills and instruction were held for this purpose; a great deal of attention was devoted to developing interchangeability within groups and crews. Well-organized mutual assistance proved greatly helpful. After a study of the periods of time spent to prepare individual components of the aircraft, subunit personnel worked out what they considered the most advantageous sequence of procedures. Rationalizers made an important contribution to the overall effort. They developed improvements for auxiliary units and equipment employed to prepare and monitor equipment. This also helped reduce the time norms.

But to be able operate equipment skillfully requires a good knowledge of it as well as thorough study of more than simply the features of its design and construction. For the fact is that each aircraft and each engine possesses characteristics peculiar to it alone. If a technician or pilot knows these fine points, the more quickly he will be able to identify possible malfunctions or problems which could cause an accident. For example, on a particular occasion during daytime flight operations, after an aircraft had taxied to its takeoff position and the pilot had cut off his engine, an aircraft technician, Senior Technical Services Lieutenant V. Gramma caught an uncharacteristic sound in listening to the turbine wind down. The officer moved immediately to investigate the problem. By feel and a number of other indications he detected a barely noticeable vibration in the fuselage. The technician reported this to the chief of flight [zveno] maintenance. Together they went over the engine and finally discovered damage to a compressor-stage blade caused by some foreign object which had gotten into the engine.

Officer Gramma is a master of his profession. All of his work on an aircraft is of high quality, and he is continually improving his technical knowledge. His high professional vigilance helped him detect the existence of the dent in this blade and thereby avert a possibly difficult situation in the air.

Aviation units and subunits devote the most serious attention to the technical training their personnel receive. They conduct it in accordance with their plan for combat

and political training. It consists for the most part in lectures, seminars and group and class instruction. To raise the level of their aviators' knowledge and improve their skills they will also hold scientific-technical and scientific-practical conferences, critiques and brief periods of technical instruction, combined aircraft and helicopter drills and other activities. The most highly trained aviation engineering service specialists, pilots and navigators provide instruction in a preplanned series of areas. Technical training remains under continuous supervision on the part of command, staff and political personnel. And this entirely as it should be, what with the fact that, as practical experience shows, we cannot properly service today's aircraft, not to mention fly them and execute difficult combat missions with them, without solid skills and thorough knowledge of all armament and equipment. Aircraft do not excuse inadequate training and exact severe penalties for it. Every pilot, navigator and aviation specialist having anything directly or indirectly to do with flight support operations should remember that. Thorough knowledge and good operational training will help an aviator extract himself from a difficult situation with his honor intact.

Major V. Gorlovoy was on one occasion on a cross-country flight above the clouds. After he had flown some distance from the airbase, the "Sbros' oboroty" [Reduce RPM] indicator came on. Having taken stock of his situation, the pilot acted calmly and efficiently: he reported by radio to the flight operations officer and immediately shut off one of his engines. He then broke off execution of his mission and took a course for his base, his flight now continuing on the second engine. Because of his skill in operating his equipment and the proficiency and competence of his actions, officer Gorlovoy was able to begin his glide precisely and despite the weather minimum execute a normal landing. This pilot had studied his aircraft well; his training in actions to take in special situations is conducted within strict time limits. So for Major Gorlovoy what occurred came as no surprise. His excellent knowledge, solid skills, composure and confidence--these are what enabled him to complete his flight successfully.

The combat readiness of any aviation unit depends entirely, as we know, upon the combat readiness of the subunits that support it. Let's say aviation specialists have bettered their norms in preparing an aircraft for takeoff, but rear-services specialists are slow in delivering the ammunition. How are we supposed to evaluate combat readiness in a case like this? In actual combat the enemy would do the evaluating. Combat readiness should accordingly be evaluated in peacetime from the point of view of the requirements imposed by actual combat operations. The effort to reduce time indicators should be a collective effort, an effort made in close cooperation, in practical and harmonious contact. Personnel of our supporting units should have a thoroughgoing understanding of whom and what it is exactly that they are working in support of and be aware of the fact that their labors, too, are contributing to the pilot's victory in the air and to the maintenance of flight safety. The following incident comes to mind in this connection.

During nighttime flight operations on one occasion, under adverse weather conditions, one of the aircraft blew a tire on its ground roll. The pilot was able to keep the aircraft on the runway. But it looked to be impossible to clear the runway immediately. Still in the air, though, were several aircraft with little fuel left. After evaluating the situation, the flight operations officer, Lieutenant Colonel V. Lyat'yev, decided to put the the group down on an alternate runway. At his orders, the shift landing officer, Captain V. Movchanov, queried the various crews as to the fuel they each had remaining and, on the basis of the location of each aircraft, quickly

determined the safe time intervals and gave the pilots their flight levels and courses to the designated points.

At the same time, at the command of Warrant Officer I. Kovtanyuk, searchlight operators quickly redirected their landing lights and illuminated the alternate runway. The air field was prepared to receive the aircraft within the shortest possible time. All crews landed safely. Aware of their great responsibility for the safety of these flights, personnel of this radar and illumination support subunit demonstrated outstanding skill and efficiency in their work and bettered substantially their established norms.

And then another example. On one particular tactical flight training exercise, missions were being flown under adverse weather conditions. After completing its mission, the aircraft piloted by Captain Golovachev received orders for him at this point to act in accordance with a hypothetical situation in which communications on all of his radio communication channels. Fully aware of what could be done under such circumstances, the pilot switched over to monitor his radio compass channel. On the ground, at the command of the flight operations officer, personnel of the outer radio beacon trick on duty quickly performed the necessary procedures and established communication between the flight operations officer and the crew via the automatic radio compass channel using the homing radio station.

Such instances are fairly rare in our flight operations. But the quick and effective response of the pilot, the flight operations officer and outer beacon personnel shed a sharp light on a number of the aspects of combat readiness: good knowledge of the equipment one has at one's disposal, fine-tuned interaction and a deep awareness on the part of personnel involved of their responsibility for the safety of flight operations.

A solid material and equipment base is one basis of successful mastery of military weapons and equipment. The facilities and equipment provided in our training classrooms and laboratories make possible not only a thorough study of hardware, but also the acquisition of the skills required to operate the numerous systems today's aircraft are loaded with. With the aid of complex, specialized simulators, flight personnel polish their piloting skills; they practice air navigation and piloting methods, combat flying procedures and techniques as well as actions to be taken in emergency situations within a real-time framework. Thorough knowledge and solid skills help develop in our fighters in the air a moral and psychological readiness for immediate and decisive action under the most difficult combat conditions.

Experience demonstrates that those units in which command and staff personnel, the political organs and party and Komsomol organizations give constant attention to improvement of the training material base will exhibit higher professional skill levels among flight and technical and engineering personnel; there will be fewer flight incidents and improvements in combat readiness will be more substantial. One of our bomber units, for example, has developed a good training base. All classroom facilities here correspond to operational equipment and time requirements. Lieutenant Colonel V. Leverash, military pilot 1st class, is devoting much effort and energy to the improvement of both these facilities and the knowledge of flight personnel. It occurs as no coincidence that the these aviators' state of flight training and the combat readiness of their subunits measure up to the requirements imposed upon them.

Summer flight training is now in full swing in the units and subunits of our Armed Forces. Highly intensive flight training is characteristic of this period. Our experienced warriors in the air, our winged youth, are mastering the technique of group flight and solo and group combat tactics, learning how to overcome enemy antiaircraft defense and practicing maneuvers and attacks on targets involving the execution of complex maneuvers and the use of live ammunition. Against a tactical background approaching as nearly as possible that of actual combat, our pilots, navigators, engineers and technicians are improving their professional skills and their psychological conditioning, while staff and command post personnel, services and flight support subunits work to improve their operational procedures. Command and staff personnel, political organs and party and Komsomol activists need to give special attention to the organization of their flights, to maintaining efficient control of crews and groups in the air and to providing them with direction from the ground with close radar control.

Socialist competition is an important means of increasing the combat readiness of our units and subunits and of improving their fighting efficiency and flight safety. Aware of their great responsibility for the future of the motherland, our military aviators are devoting these days of intensive training to mastery of the latest weapons and equipment and the methods and techniques of employing them in combat, strengthening discipline and improving organization and procedures, striving to make their own contribution to our glorious military traditions and holding themselves in a continuous state of readiness at any time to rise in defense of their fatherland and of the countries of the socialist commonwealth. "Any time," declared L. I. Brezhnev, General Secretary of the CPSU Central Committee, at the 26th Party Congress, "the interests of our national security and of defending the peace require it, when it is necessary to come to the aid of victims of aggression, the Soviet soldier stands before the world as a benevolent and courageous patriot, an internationalist prepared to surmount any difficulties."

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HELICOPTER TRAINING FOR ASSAULT DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA IN Russian No 7, 1981 (signed to press 2 Jun 81)
pp 4-5

[Article by Colonel B. Budnikov, military pilot 1st class "Helicopters Land an Assault Force"]

[Text] There was only one route to the concentration area before the decisive attack--through the pass. But "enemy" rifle subunits (podrazdeleniye) had made their way up the steep paths and occupied it. Within only a short period of time they had prepared fire positions here and adjusted upon the approaches to these positions.

After evaluating the situation, the commander decided to land an assault force in the immediate vicinity of the defenders. According to data from reconnaissance, not far from the "enemy" formations was an area suitable for landing helicopters. True, only two helicopters could land here at a time. And this area could be approached only through a canyon, the sides of which were being raked with large-caliber machine gun fire. So the risk involved was by no means a small one. But if they succeeded, the attackers would win their most important objective--time.

During their meeting, the commanders of the rifle, artillery and aviation subunits worked out a detailed tactical battle plan and agreed upon signals to be employed in cooperation and target designation and radio communication procedures. According to their concept, the attack would begin with a fighter-bomber strike, after which their artillery would open fire. Three minutes before the artillery ceased fire, the helicopters would move to their initial point of maneuver and, at the command of the air support controller stationed with the batteries, enter the canyon. After landing its troops under cover of the fire-support helicopters, the first pair would join the group attacking the defenders' positions and supporting the landing of the second pair. Subunits of the assault force would then immediately engage the "enemy" in combat.

The crews began their preparations. Captain A. Krivtsun, military pilot 1st class and air squadron navigator, plotted the route and determined the optimum time intervals between each pair and flight (zveno); he then prepared tables for the maneuver with speed for each leg. Engineer Major Yu. Leus selected the most suitable variant of a plan for loading the helicopters. In the process of executing a landing at more than 2500 meters above sea level, each kilogram of weight is of great importance. The engineer made specific recommendations concerning fuel and ammunition loads and the number of people each helicopter could carry. Having prepared their maps and

engineering and navigation plans for the flight, crew members agreed upon procedures for cooperation in overcoming the "enemy's" antiaircraft defense and the mode of radio communication to be employed both en route and in the vicinity of their objective.

For now, the meeting was still under way; details were being ironed out concerning the upcoming landing; troops of the assault force constructed a model of the canyon and the pass with its characteristic landmarks and the twists and turns of the rocky corridor. A short time later, flight personnel moved to the area where the ground-forces subunits were assembled. Together they gamed the mission using the dismounted flight method on a model of the terrain.

After checking on the preparation of his men, Lieutenant Colonel O. Kucherenko, squadron commander and military pilot 1st class, came away satisfied. The crews and assault troops had a good understanding of the mission they had been assigned and had the action they were to take clearly in mind.

At the designated time the helicopters of the assault group lifted into the air. Taking off after them at their assigned time intervals were the machines carrying the assault troops. Fire-support helicopters provided the whole combat formation cover from above.

The column of pairs now passed a reference landmark. Circling around the ridge of mountains, it began the last leg of its flight. A few minutes later the silhouettes of the fighter-bombers streaked by overhead. One pair after another they disappeared behind the mountain tops; an instant later they would climb sharply into the dark blue sky and then once again streak down toward the earth. The airwaves carried the instructions coming from the air support controller, who was now giving them corrections. The "battle" was on.

The helicopters were being buffeted about in the turbulent air, but their pilots held them tightly to their assigned intervals and distances. Lieutenant Colonel Kucherenko glanced over the formation. The group was made up of different kinds of pilots--different by virtue of their experience, the character and their temperament. But the commander had no doubt that they would be able to accomplish their mission. He was well aware of the training and capabilities of each man. There were no weak links in the squadron.

"641, enter the canyon at my command. Artillery now working," came the voice of the air support controller through the headphones.

"Roger! We're approaching our initial point of maneuver," Kucherenko replied.

Fighter-bombers streaked by overhead on their approach course. The dust and smoke shrouding the target after their strike posed no problem for the artillerymen: their guns were pounding the fire positions, whose coordinates intelligence had established earlier by intersection.

"641, cleared for entrance," the voice again from the air support controller through the headphones.

"Roger! Two minutes to target," the commander replied, then to his wingmen gave the command: "Turn!"

The helicopters dove into the rocky corridor. The most critical phase of their flight! The assault group now began to work out its approaches as it flew. To turn back at this point was impossible; not to put down at the landing site was also unthinkable. If even one crew broke up the formation or delayed his landing--the mission would have to be aborted.

The "enemy" had not anticipated the arrival of the helicopters, and he proved unable to organize any effective resistance. The fire-support helicopters swept the landing site with fire and attacked the defenders' positions. An intense concentration of rockets now struck his fire points. The first pair of assault helicopters were soon approaching the landing site. The riflemen immediately took up their starting positions for the attack. After clearing the landing site, the helicopters lifted off into the air. The next ones took their place. More and more helicopters were now landing their troops and increasing the size of the assault force. When the last of the assault troops hit the ground, a loud "Hurrah!" broke through the roar of the battle to greet the "enemy." The subunits now moved to their attack. Fire-support helicopters patrolled overhead, pouring machine gun and cannon fire onto isolated pockets of resistance in the cracks and crevices of the terrain.

Soon it was all over. The assault troops, well-trained to conduct combat operations in mountainous terrain, had completed the mission begun by the helicopter crews. The "enemy" had been destroyed, and the way was now clear to the main-force concentration area.

It could be said without exaggeration that the attackers had been able to achieve this success as a result of effective cooperation, the excellent training of both the ground and air forces, competent planning and skillful tactical control. Also worthy of attention is the fact that both ground and air force subunits played an active role in preparing the operation. Assault troops helped the pilots by constructing a model of the canyon and the pass. The aviators, in turn, provided artillerymen with the exact coordinates of the "enemy" fire positions. In other words, the aviation and combined-arms subunits approached their objective arm in arm and thereby achieved success. Personnel participating in the assault on the pass were cited for outstanding performance in executing their assigned mission, while Major A. Sidorov and Captains A. Sapega, A. Ivanov and A. Petrov received command commendations.

Landing an assault force in mountainous terrain requires thorough training and preparation as well as analysis of the situation involved. As practical experience has demonstrated, airborne assault missions are executed most successfully where the tactical plan has been worked out with close contact between the air force subunits and ground forces involved.

This exercise was a good school of training for our aviators. In analyzing crew performance en route as well as in the vicinity of the objective, the squadron commander identified a number of deficiencies; on the basis of specific examples, he pointed out the importance of timely tactical planning. The experience gained by the top-rated collective was widely disseminated among the other subunits.

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HELICOPTER GROUND SUPPORT TRAINING

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[Article by Colonel Yu. Belyayev: "A Third Variant"]

[Text] We were familiarizing ourselves with the field air base with Senior Lieutenant Yu. Popov. It was another routine flying day. Having begun to prepare the helicopters before the new day had even dawned, the aircraft specialists worked harmoniously and cooperatively; they had thus been able to complete all preparations in less than the time allotted. Having just risen from behind the steep hills nearby, the sun was sending its first rays to the earth when groups of combat helicopters had lifted off into the blue morning sky. There were a variety of tactical flight exercises--bombing and firing on "enemy" ground targets, reconnaissance of roads and facilities in the depth of his defense and execution of other missions.

Flight commander Captain V. Stepanov's crew, in which Senior Lieutenant Popov serves as an operator, had led a pair [para] up a number of times. The helicopter pilots first would spot a highly reinforced defending "enemy" strong point in a mountain ravine and bomb it on their run. They were then instructed to bring "wounded" and "casualties" in from the battlefield. On its third sortie the pair operated in support of a motorized rifle subunit attack. The crew received the highest rating for all these missions.

Popov had enough to do that day in the air. And on the ground as well. The officer would help prepare the helicopter for its next mission. This has long since been squadron routine. Help from flight personnel permits substantial reduction of the time required to bring equipment into combat-ready condition. And the breaks between sorties would find him, the flight navigator, trying to go over the various functions of his subordinate operators in as great detail as possible; he would pass on brief bits of practical advice on the best way to orient oneself over mountainous or desert terrain or the quickest way to find a skillfully camouflaged "enemy" or how to fire during attacks involving different types of maneuvers.

It was only when he had a few free minutes of rest time that Senior Lieutenant Popov would come back to his story about the subunit's activities and his comrades within the formation. He spoke only briefly and least of all about himself. I already knew a little bit about this officer, incidentally. I knew that he was a good specialist, cool-headed and deliberate. According to his superiors and comrades-in-arms, Yuriy loves his chosen vocation of air combat soldier very much. He gladly participates in

the social life of his unit (chast') as well. He is a member of a people's control group. Then, too, he likes to entertain himself working with "materials," things-- he has built a minicar all by himself.

But flying is Number 1 for communist Senior Lieutenant Popov. From his trainer aircraft he advanced to a fighter. Then he crossed the skies for a time in a communications aircraft. And when there was a requirement, he became a helicopter pilot. He has had occasion to fly in Siberia, the central part of the country, the Ukraine, the Baltic and in the Transbaykal. And now fate has brought him south, to a mountainous region. In a word, this is by no means something that comes to every young pilot, this despite the fact that Popov's entire biography can still fit on a single page.

"We have excellent machines. I'm really hooked on helicopters. I enjoy my work as an operator and flight [zveno] navigator," Yuriy told me.

Captain V. Stepanov then added: "I like flying with Popov very much. If Yura's in the forward cockpit, I'm absolutely relaxed and confident that everything's going to go all right."

Simple words, but at the same time noteworthy words. They were spoken in a way that clearly brought home the importance and conviction they carried: who could know a man and characterize him better than his immediate superior? All the more would this be the case if they have served together for many months and spent hundreds of hours together in the air. Officers Stepanov and Popov will remember many of their flights for a long time, but there are some they'll never forget.

A fierce "battle" had raged in the mountains from dawn to dusk without a letup. Reconnaissance data were showing that the "enemy" should be running out of ammunition. In the meantime, though, it was nighttime and he was continuing to resist attacking motorized rifle troops with weapons fire as heavy as it had been in the morning. At this point the ground subunit (podrazdeleniye) commander turned to the helicopter pilots for assistance. The mission they had for Stepanov was to find out where the "enemy" was getting his shells and cartridges.

"I imagine a pair of helicopters will be enough to do the job," he said, sharing his thinking with his flight navigator.

"I agree," Senior Lieutenant Popov replied. "That'll make it easier to maneuver in those mountain ravines."

After listening to the reasoning his men had laid out, the squadron commander approved their plan: having to control only a single crew behind would allow Stepanov to pay more attention to his visual orientation and to searching for his objectives on the ground, while at the same time it would be easier for his wingman to pilot his helicopter and concern himself with his reconnaissance of the ground.

"The 'enemy's' probably getting his ammunition from a single place. So there'll be a dump there. If that's the case, destroy it. That will insure the success of the motorized rifle subunit," the commander pointed out as they parted.

"We'll get it done," Captain Stepanov assured him.

It didn't take long to prepare for their flight: aviators have good knowledge of the area and the directions of the mountain roads and the main paths; they make skillful use of the snow-covered peaks of the ridges to orient themselves. Besides, they have plotted many of their routes ahead of time, so that before a flight they have only to make minor changes or add a detail here and there.

So this pair of helicopters lifted off on its mission in the morning. Maneuvering in accordance with his flight model, Stepanov passed safely through zones of possible counteraction from "enemy" antiaircraft defense weapons. Tacking along the canyon to the extent conditions permitted, the helicopters combed the area in which it had been suggested the ammunition dump might be located.

Senior Lieutenant Popov trained his eyes until the strain brought pain on the rocky slopes of the training ground and the small open spaces slipping by beneath the helicopter; he scanned the paths leading off from the road. Captain Stepanov and the men in the second crew followed the terrain closely. Three minutes passed, five, seven....

Then targets suddenly stood out from one of the boulders--full-figure human silhouettes.

"Commander!" Yuriy nearly screamed through the intercom. "Look...."

"I see it," Valentin immediately replied.

"There are people right there near those two large boulders," the wingman reported over the radio.

"123, let's hit them!" Stepanov immediately ordered, starting his turn. The report flashed back to the air base: "We've spotted the dump."

The "enemy" had chosen a very good place for his ammunition dump--you could hit it by coming in from only one direction. Not only that, it was well-screened and protected by two large boulders. So these helicopter crews had an extremely difficult task ahead of them.

The first salvo of rockets hit near the rocks. After they had broken off their attack Popov saw that his wingman's rockets had been ineffective. This lack of success irritated him.

"Maybe we could hit it from the other side," he said to Stepanov hopefully.

"We can't--the mountains are in the way," Valentin replied dully. "We'll try another approach."

But the canyon again refused the aviators any opportunity to get a good aim.

"Is it really possible that we won't be able to accomplish our mission?" The very idea made Popov's heart pound even faster. Yuriy feverishly evaluated the situation; he went over one variant of an attack on that miserable dump after another and then promptly discarded them one after another. Finally a solution to the problem began to take shape.

"What if we could explode the dump with machine gun fire, commander?"

"How's that?"

"Pretend we're turning back, and I'll explain."

"OK," Valentin replied, holding his machine on a straight course.

"We'll have to cut down on the altitude and speed of our attack," Yuriy continued in the meantime. "so I'll have more time to aim."

"OK, we'll try it; otherwise we'll have nothing to go back with," Stepanov agreed.

"Let's approach for our attack," flashed the command over the air waves.

Maneuvering skillfully, the captain took his helicopter right up against the outcroppings along the mountainsides. The senior lieutenant pressed himself to his sight. "If only I don't miss now"--this was the single thought now hammering at his consciousness. One second, two seconds, three seconds.... Popov fired off one burst--a hit. A second burst hit the target as well. Flame shot up from the ground. Then the prolonged roar of the explosion, pieces of board and plywood and chunks and chips of rock flying in all directions.

"That's it, Yura!" Valentin Stepanov did not restrain himself.

When they got back, his comrades shook Popov's hand warmly and vigorously: the news that he had been the one who had set off the dump spread through the squadron like lightning. The helicopter pilots then got word of the success achieved by the motorized rifle troops. Deprived now of the biggest part of their ammunition, the "enemy" weakened in his resistance and then ultimately withdrew from the positions he had been occupying.

This was only one flight. But how many have there been, unique and unforgettable, how many like this for officers Popov and Stepanov. Would it really be possible to forget the time when a heavy "enemy" roadblock on some mountain roads was blocking the path of a subunit executing a mission as part of a flanking detachment. Helicopter pilots came to the rescue this time, too.

The main threat these motorized rifle troops faced came from guns carefully concealed in caves and crevasses and having fairly wide sectors of fire. To destroy them from the ground was impossible. To do this from the air would be extremely difficult.

"So we then put all our hopes on our weapons people," communist officer Stepanov explained.

Yuriy Popov and his men did not disappoint anybody; they won a difficult duel with the "enemy." Their skillful fire, stamina and persistence and well-developed tactical thinking had carried the day. By neutralizing those weapons, the helicopter pilots had made it possible for the flanking detachment to continue its advance. After coordinated frontal and flank attacks, the attackers were accordingly able to take this important pass.

The fire-support helicopter in which Senior Lieutenant Popov now serves as a crew member is his second helicopter--prior to this assignment he flew aboard a transport helicopter. The equipment on board this helicopter and the methods of combat employment entailed differ substantially from those associated with the one he flies now. But then, life goes on, and, in the process, hurries a person, particularly the military man, along with it, continually forcing him to study.

And Popov applied himself to his studies diligently. The ability to bomb and shoot accurately does not come all by itself. It required long hours of classroom instruction and drills under the direction of experienced commanders, as well as flights in execution of a variety of training exercises, for Captain Stepanov to be able to say simply and without stretching the truth in the slightest: "When Yura is in the forward cockpit, I can relax."

One particular statement by the flight commander comes to mind: "We fly like we do anything else, as though we've done nothing particularly remarkable."

There was no false modesty in this. Perhaps there are flights and crews in the unit, maybe even in the squadron, whose performance should be rated a little higher. But the subunit in which Senior Lieutenant Popov serves as navigator numbers among the leaders in both combat training and the socialist competition which has developed with new force among helicopter personnel here since the 26th Party Congress concluded its labors. They are full of determination to mark the first year of the Eleventh Five-Year Plan with new successes in their difficult military mission.

There is no doubt that communist officer Yuriy Popov will make his contribution to the effort to achieve this goal as well. He sees his primary task to lie in increasing the knowledge and improving the navigational and fire training of flight personnel. He does have something to offer, and the senior lieutenant gladly passes his experience along to those who need help.

These amount, so to speak, to concerns of the air. There are no few to deal with on the ground as well, problems one way or another effecting the effort to increase the squadron's combat readiness and successful fulfillment of socialist obligations which have been undertaken. Just take his work with the people's control group. At a field air base it is understandably more difficult to create conditions required for profitable training and instruction, comfortable personal existence and rest and relaxation. One of the troops who used to complain about any difficulty whatsoever, any kind of disorder, was in the habit of performing his duties without exerting much effort. The controllers came down hard on this. The commander, the political officer and the party organization supported the people's patrol, and the deficiencies were remedied.

Popov is a restless sort. Valentin Stepanov told me: "Sometimes you're very tired when you come back from your flights, and you lie down on your bunk in the tent. But Yuriy over there will be boning up on something. You'll say to him: 'Aw c'mon, relax, take a break.' But he doesn't take any break."

In both the classrooms of the permanent training facility and at the field air base you will find a great many manuals that officer Popov has put together. Each new one is evidence of the author's ingeniousness, search for more efficient solutions to problems and aesthetic taste.

A field club and a wide-screen cinema would appear to be incompatible ideas. But Popov has made them compatible. He spent no few evenings after coming back from his strenuous flights sitting over his drawings trying to find the best way to build the thing. Then he found some helpers. The efforts of these skillful men did not go for nothing: helicopter crews are now watching movies in their club on a wide screen.

Incidentally, Yuriy enjoys the reputation within the squadron of being a jack-of-all-trades. He can cut his comrades' hair, for example, and do it well enough to be the envy of the specialist. Now this is of no little importance under the conditions prevailing at a field air base: a neat personal appearance improves a troop's frame of mind, and a man with a good attitude finds things going well and the hardships of service life easier to bear. But let's get back to what we were saying about his rationalization efforts.

The most valuable contribution, a jib to use in replacing helicopter engines, is a result of the combined efforts of Popov and helicopter flight technician Pavel Nikitenko. It is small and light enough for two men to be able to carry it without any particular physical exertion. If necessary, the device can be easily stowed in a helicopter cargo compartment and flown, for example, to the site where another helicopter may have had to make a forced landing.

"How'd you get the idea?" I asked Yuriy.

"Well, replacing an engine is an extraordinarily laborious business, generally speaking," the senior lieutenant replied after some hesitation. "We'd ordinarily have to use a truck-mounted crane. But I got to thinking: 'Where in the world are specialists at an air base out in the field going to get their hands on something like that when with intensive maintenance operations under way it's no simple matter to get a crane at a permanent facility?' Then in addition to that, the operations entailed in this procedure require a highly skilled crane operator and exceptionally close cooperation between him and the person directing the removal and installation of the engines involved. There's no room for the slightest mistake here; you'd otherwise inevitably damage this costly aircraft hardware."

If a man who likes to build things is suddenly seized by some creative idea, he usually pursues it until either he gets what he wants out of it or he finally becomes convinced that his idea is absolutely worthless.

Senior Lieutenant Popov and Senior Technical Services Lieutenant Nikitenko first looked at a version which would remove one of the main rotor blades before the engine was removed. But they quickly rejected this one, because this operation would entail completely unproductive expenditures of time. They decided to go with another one. But this one, too, held out no promise of any particular benefit.

Transfer time was upon them, however. They had to move fast. They discussed a third version and found it the most suitable. The process of deciding upon the right design took a total of five days. Popov then set out with the drawings of the different components of his jib for one of the plants in town.

"They adopted an understanding attitude toward my request there, and the workers got everything made in good time."

The use of this jib device has proven fully justified. Unproductive expenditures of manpower and equipment for engine replacement have been eliminated. Nobody in the unit has ever figured up exactly how much of the people's money this has saved, but everybody agrees that the figure would be substantial. In addition, this innovation has increased flight safety, because there is now the complete certainty that in the case of a forced landing this device will now be delivered to any area a truck-mounted crane could not reach because of an absence of suitable roads.

"Thanks to the use of this jib," declared the deputy squadron commander for aviation engineer services, "we are now almost always able to maintain virtually all our helicopters in combat-ready condition without any outside assistance."

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AIR FORCES

RAISING PILOT, NAVIGATOR QUALIFICATIONS DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 7, 1981 (signed to press 2 Jun 81) pp 8-9

[Article by Col Gen Avn V. Andreyev, Meritorious Combat Pilot of the USSR, Combat Sniper Pilot: "Back Up Pride with Responsibility"]

[Text] The concern of the Communist Party and the Soviet Government for the development of our military cadres, the increasing methodological skills of staff and service commanders and officers and political personnel, the high level of training provided our new officers in their schools and academies and the continued improvement of our aviation hardware and training equipment and facilities all contribute to successful accomplishment of the tasks involved in the effort to raise the proficiency ratings of our pilots and navigators.

I recall my own days as a lieutenant. Proficiency ratings for flight personnel were just then being introduced. There was only one military pilot 1st class in the unit I was serving in--and that was the regimental commander. How we youngsters admired that badge of his. It was evidence of the many difficult and important flight missions he had accomplished in outstanding fashion, of the hours he had spent in classroom instruction, of his military maturity and store of command wisdom and of his ability to act independently and confidently in any situation and to bring other along with him. All this could be expressed in the simple, but at the same time all-encompassing and very precise notion that he was a top-rated fighting airman. We all knew the commander was proud of his proficiency and tried to measure up to him in both the big things and the small things.

Many years have gone by since then. Aviation has taken great strides forward. There are many military pilots and navigators 1st class now serving in the Air Force. And their number grows with every passing year. In our regiments you will now frequently encounter officers proudly displaying on their jackets the combat sniper pilot's and combat sniper navigator's badge.

"Soviet military science," Comrade L. I. Brezhnev, General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, has pointed out, "rightly rejects the scholastic disputes engaged in in some countries as to whether people or equipment are more important in modern-day warfare. Our view is that success hinges upon people armed with modern equipment, who have mastered the use of that equipment to perfection, people of steadfast ideological commitment who are convinced of the rightness of the cause they are defending." The specialists

with the high proficiency ratings are precious assets, the pride, of our units. They are the ones charged with the most important missions, and, as a rule, they are the group leaders. Their commanders and comrades know that the sniper, the combat pilot (navigator) 1st class, will destroy his air or ground target on the first approach or with the first attack, acquire necessary reconnaissance data within the shortest possible period of time and land an assault force or a cargo precisely on time and on target.

In the course of one particular tactical exercise it became known that "enemy" tanks were advancing toward the flank of our attacking subunits. A fighter-bomber group led by Lieutenant Colonel A. Vakulenko, a communist and combat pilot 1st class, was assigned the mission of breaking up this tank attack. Air reconnaissance had been unable to pinpoint the location of the tanks. So the leader decided to lead his group to the area in which the tanks were considered likely to be located and to deliver an attack on the basis of data from its own latest reconnaissance.

The missile-carrying aircraft flew down over the treetops of the dense coniferous forest. The pilots scanned the ground but were unable to detect anything. Suddenly one of them reported: "Tanks below us; they're camouflaged." At that very same instant, the commander spotted the skillfully concealed armored vehicles. In just a few seconds the leader made his decision. His authoritative voice came over the radio: "Maintain formation. Stay on previous course." Why did he give this particular command? Because Vakulenko knew that having so skillfully camouflaged his tanks, the "enemy" was calculating that his combat vehicles would not be spotted from the air; that was why his antiaircraft defense weapons were remaining inactive. That being the case, he decided he could not alter his combat formation, maneuver his aircraft or do anything else that would give the "enemy" the idea that his intentions had been discovered.

Only after the tanks had been left behind and the aircraft were out of the zone in which they could be observed from the ground, the fighter-bombers turned and delivered a surprise attack right on target from another direction. The "enemy" had neither the time nor the opportunity to bring his antiaircraft defense into action. The mission had been accomplished in an outstanding manner.

The names of officers A. Bokach, B. Vannikov, A. Gun'ko, A. Kudryavtsev, N. Sopov, V. Yevgushchenko, Yu. Yerevin, G. Mukhametov and others, combat sniper pilots and combat pilots 1st class, are well-known throughout our units (chast') and subunits (podrazdeleniye). We could speak no small number of words in praise of each of them. Guards Lieutenant Colonel Bokach, for example, is rightly considered one of the most highly skilled combat aviators in the regiment. For a number of years he led the unit's best squadron, its members masters of tactical employment [master boyevogo primeneniya], but he has recently been promoted.

Thanks in large part to the efforts of these comrades, the subunits and units in which they serve confidently lead in socialist competition; they are intensifying the pace of their summer combat training, striving to mark the year of the 26th CPSU Congress with outstanding success in military duty performance. Our officers' performance gives evidence of their deep ideological conviction, their love for their chosen vocation of winged defender of the motherland, their pride in their vocation and in their high personal proficiency and of their continual striving to advance further along the course of improving their skills and to add to the military traditions of their subunits and units as well as of the Air Force as a whole. These are the men against whom their comrades-in-arms take their measure.

Highly proficient pilots and navigators always exhibit a characteristically high level of professional training, a maturity in their grasp of tactical problems and an ability to absorb the complete picture of a tactical situation quickly and then to comprehend the concept and intentions of their commanding officer and the role they are to play in the execution of his plan. They are typically capable not only of properly evaluating a situation in the shortest possible period of time, of familiarizing themselves with it, mastering it, as we would say, and of determining upon the most advantageous mode of operation, but also, on the basis of a thorough study of the adversary, of penetrating, insightful anticipation of his possible operational options and of maneuvering both in the air and on the ground. These qualities are now exceptionally valuable, for the victor in modern-day warfare will be only the one who, taking into account the high speeds, long effective ranges and the mobility of today's means of waging armed warfare, is capable competently and quickly of planning his course of action and, consistently overcoming enemy resistance, of acting in accordance with his own concept. The enemy will be overcome by the one who acts the more vigorously and decisively, who fights the more resourcefully to seize and hold the initiative, and who then is capable of moving boldly to break up the plans of the enemy and in turn imposing his own will upon the enemy.

Each passing day sees our units and subunits improve the methods they employ in working with their most highly trained flight personnel. Primary importance in this work attaches to the process of tempering their aviators ideologically, to development of a thoroughgoing understanding and mastery of the materials and decisions of the 26th CPSU Congress and of the theses and conclusions contained in the report presented by Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee, to the development in their officers of high moral, political and professional qualities and to the indoctrination of them in the glorious traditions of our party, the Soviet people and of the USSR Armed Forces.

Over the course of the summer period of combat flight training, at the initiative of the leading commanders, staff officers, political personnel and party and Komsomol activists, socialist competition has developed still more extensively for the right to execute a flight to be recorded in the flight log of a Hero of the Soviet Union inscribed permanently on the unit's roster of flight personnel, for the right to be awarded commendation cards in the name of heroic former members of the unit. A period of particularly important flights and exercises finds discussions being held, for example, on how troops of the unit would execute a similar mission during the war and on what characteristic or noteworthy aspects of the combat operations they were involved in could be applied to maximum advantage at the present time. Illustrative agitational material appropriate to the theme is then disseminated.

We are now seeing more vigorous efforts made to introduce into the training process the latest forms of training flight personnel for the classroom by employing the assembly method. This makes possible more purposeful, more goal-oriented solution of the problems associated with officer training, the involvement in it of the best methods specialists and instructors and the most advantageous utilization of combat training aircraft and weather conditions. We are striving to insure that our pilots and navigators do not simply operate an aircraft or helicopter and use its equipment, but that they also develop an increasingly clearer understanding of the essential nature of the physical phenomena occurring in flight and thorough knowledge of the structural and design features of their aircraft and its systems and instruments in addition to the rules governing their operation and employment in combat.

These programs are yielding positive results. But we remain far from having done everything we can. This is why today we must declare forthrightly that for not all of our top-rated pilots and navigators has pride in the rating which has been awarded them become a motive stimulating them to further improvement of their political, military and technical knowledge and developed in them a greater sense of responsibility for training and preparing for each flight as well as for the results of these flights.

Complacency, the erroneous notion that they have achieved all there is to achieve and a disregard for training exercises all will ultimately create a situation in which people make serious mistakes and become the cause of flight incidents. We cannot go without calling attention to the fact that some commanders, staff officers, political personnel and party organizations slacken in the demands they make upon pilots and navigators having high proficiency ratings. And then the latter, making the most of this lack of control and indulgence, become indisciplined, occasionally even going so far as premeditated violation of laws governing the flying service. As a rule, they cannot long continue so heedless before they have to pay for it.

Major N. Gayfullin, a combat pilot 1st class, was able to make it to a range that he knew well only after repeated instruction from the command post. But then once he got there he began dart about at random, as they say, because he was unable to spot the target. At the command of the range flight officer, the major broke off his mission and returned to the airfield. But his misfortunes did not end there: the pilot approached the runway too fast and landed 150 meters from the end of the precision landing strip. What was to explain all this? Gayfullin had been negligent in preparing for his flight, but his supervising commander was not able to detect this because he was concentrating all his attention on checking the flight preparations being made by his younger combat aviators.

And then I recall another instance. This was on a clear, quiet night in May. In landing the pilot masterfully "seated" his fighter right in the center of the precision landing strip.

"Outstanding!" The senior officer, who was there in the command post, could not restrain this commendation.

"Nothing out of the ordinary," the flight officer returned with a nod. "A pilot 1st class, officer Shirokov, is in the cockpit, you know."

The aircraft completed its landing run, taxied back and then.... ended up off in the dirt: the pilot had confused the runway lights with lights marking the beginning of the taxiway. And this at an air base from which V. Shirokov had been flying for six years. He had disregarded rules well-known to all aviators: you must maintain the utmost in attentiveness and discipline from the moment you take your place in the cockpit until you climb out of it and act as responsibly as possible during the flight as a whole as well as in connection with each of its elements individually.

The number of our top-rated pilots and navigators is growing continuously. This has a great effect upon efforts to increase the combat readiness of our units and subunits and to improve flight safety. At the same time, however, we cannot avoid pointing out that opportunities in this regard remain unexploited, that potential remains untapped. We are far from seeing all 1st-class pilots and navigators being capable of executing a mission with an efficiency rating that would exceed by two or three times the average

ratings received by specialists 2d class or 3d class. Add to that the fact that the number of errors and incidents we are experiencing is not decreasing inversely proportionately to the increase in the number of top-rated flight personnel. Here we see the effect of failures to insure proper selection of personnel to train for higher proficiency ratings as well as of a situation in which frequently almost the only criterion employed in evaluating their readiness for examinations is accrued flight time and inadequate consideration is given to moral and psychological temper, level of tactical skill, attitude toward the service and so forth. Commanders occasionally are simply trying to satisfy their plan requirements, in consequence of which they are to be found relaxing their standards.

The following incident occurred not long ago in one of the district's air training units. Major A. Rubtsov was executing an interception as part of his program of preparation for tests to qualify for a higher proficiency rating. Playing the role of his "enemy" was Captain A. Popov, a specialist 1st class. In this relatively simple situation these fairly experienced pilots made some very serious errors, which almost had grave consequences. This occurred as a result of the inadequate training and preparation of officers Rubtsov and Popov for this specific flight and the indulgence on the part of the commander responsible for verifying their readiness for the flight.

We see these deficiencies and others like them, of course, try to remedy them and approach more rigorously, more exactly, the task of selecting and preparing candidates for higher proficiency ratings.

But even more important, perhaps, is in no case to slacken in our work with pilots and navigators who have already received their sniper and 1st-class ratings. We need to work continuously to develop in them a sense of pride in the confidence which has been placed in them and the firm conviction that there is really no limit to the improvement they can make in their combat skills and that a high proficiency rating imposes upon them the obligation to continue their progress, to strive for still greater achievements and always and in everything to set an example for other pilots and navigators and to bring them along with them. "The striving for quality and efficiency is no abstract notion, but rather a matter of daily practical concern for each soldier," points out Marshal of the Soviet Union D. F. Ustinov, member of the CPSU Central Committee Politburo and USSR Minister of Defense. "This imposes upon us the obligation to strive consistently for mastery of the science of Marxism-Leninism and excellence in our performance of combat training tasks and our mastery of the use of our military weapons and equipment, to earn and then improve upon our proficiency ratings and to strive continuously to maintain military honor and worth, to conduct ourselves in an irreproachable manner, to maintain exemplary personal appearance and military bearing and to adhere to our norms of morality both on duty and off." To stand still on the path to continued improvement of military skills, to ease up on the pressure, to cut down on the amount of training and preparing we do, something not always noticeable to the eyes of others--all this is to doom oneself to failure, or otherwise generally to see everything one has achieved go for naught.

Rigorous and exacting demands on oneself, to strive continuously to improve one's political, military and technical knowledge, flight and tactical skills and moral, psychological and physical temper so as to be able to fly better today than one flew yesterday and tomorrow better than he flies today, and not simply to fly, but to achieve the highest quality in his performance of combat training tasks--this is the only true path for a pilot or navigator to take to acquire, maintain and improve his

mastery of combat skills and which will give him a proud consciousness, to be compared with nothing else, of exercising real power over that awful and powerful fighting machine and of being able to be in control of himself. The reports by Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee, and Comrade N. A. Tikhonov, chairman of the USSR Council of Ministers, to the 26th CPSU Congress as well as delegate speeches gave no little attention to the need for each Soviet citizen to develop a greater sense of personal responsibility for the particular task or tasks with which he has been entrusted. This is of direct relevance to us as military. Our top-rated combat aviators can and must set an example for their comrades-in-arms; it is upon their training and preparation that to a great extent depends continued progress toward greater air unit and subunit combat readiness.

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AIR FORCES

USE OF ON-BOARD COMPUTERS FOR NAVIGATION

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 7, 1981 (signed to press 2 Jun 81)
pp 10-11

[Article by Major General of Aviation A. Shabunin, USSR meritorious military navigator: "On the Combat Course"]

[Text] The combat aircraft appeared at precisely their assigned time over the training range and streaked toward their target. The explosions of the aerial bombs and bursts of cannon fire broke through the howl of the powerful turbines. The pilots were executing a tactical practice mission, demonstrating high levels of piloting and navigational skill and accuracy in their bombing and weapons fire.

Then for some time all was quiet over the range, the dust raised from the last explosions finally settling. Everyone was now waiting for the aircraft in which Captain A. Nikolayev, military pilot 1st class, was to execute a bombing mission after the others. Although his time and course in approaching the range were known, the appearance of his aircraft nevertheless took people by surprise. A rapid approach, then a crisply executed vertical maneuver.... The aircraft was already out of sight when a powerful explosion roared out over the target, blasting away the model which had been constructed there.

Skillfully using his advanced piloting and navigation system, the pilot had covered a distance equal to his aircraft's maximum radius of action, executed his mission in an outstanding manner and then returned to land at his air base. His course, moreover, had taken him over terrain devoid of reference landmarks.

At the postflight critique, the commanding officer referred to Captain Nikolayev's high level of combat and piloting and navigation training and preparation and presented him a valuable gift.

In contrast with the commander of a multiseat aircraft, the pilot of a single-seat aircraft pilots the machine in the air himself; he does his own navigation, performs his own target-attack computations and many other things as well. The quality of his performance in executing his combat mission and a safe return to his base depend entirely, of course, upon the level of his navigational skills. Deficiencies in navigational training lead inevitably to complications in the course of a flight or else to an aborted mission.

The history of the tactical employment of aviation during the Great Patriotic War knows instances in which pilots lost their orientation in the process of disengaging from combat or after completing their mission. And not infrequently the reason was poor navigational preparation. Under normal conditions they would have been able to correct their position and reorient themselves. But the great psychological stresses of actual combat did not permit them time to compensate for errors and miscalculations.

Today's third-generation aircraft are equipped with advanced sighting and navigational systems and digital and electronic computers. Proficient utilization of these systems makes possible substantially greater air navigational accuracy and cuts down on the work load imposed upon the combat aviator. Nevertheless, the most important component of the man-machine system remains the man controlling the machine, and there are in fact situations in which automatic equipment is not the primary means of accomplishing navigational and combat tasks. And if an enemy were to be employing intensive jamming, it would be even more difficult to dispense with the use of traditional air navigational methods.

Practical experience demonstrates convincingly that it is those pilots who have to perfection mastered the use of their navigational systems as well as the practically proven methods of computing route from course, time and speed, who can determine navigational elements in the air and perform the necessary computations in their heads, who are always prepared to take the proper action in case of equipment failure and who can compute the error in equipment readings in a proficient and timely manner--it is these pilots who can be considered well-trained from a navigational point of view.

At the very first opportunity after takeoff, an experienced pilot knows he must compare the readings of his automatic systems with his computed readings and be certain that they are correct. As a rule, he does this on the least eventful leg of his flight, which has been selected earlier specifically for purposes of control. On the straight leg of the flight to his target nearest his air base, for example. Using on-board as well as ground navigation systems, he must compare computed data with actual readings on his on-board system and draw some conclusion as to the latter's accuracy. All on-board equipment, of course, has been thoroughly prepared and checked out on the ground. Professional alertness and attentiveness in the course of a flight are extremely important, however. I will cite one example.

Captain Yu. Khorpyakov, a military pilot 1st class, was soloing for the first time in the stratosphere in an aircraft that was still new to him. So after taxiing out for his takeoff, instead of pushing the "Soglasov." [match] button, he pushed his "NVK" (initial course indication) button. As a result, his incorrect SKV [expansion unknown] readings distorted the information being fed to the computer, which in turn output data at each programmed point with an error of many degrees off the computed course.

The pilot's improper actions consisted in his failure to check the direction in which his aircraft was flying (in order to determine its location) with reference to the position of the sun and auxiliary radio-technical equipment and his reliance on his automatic equipment alone.

Was the pilot in fact responsible for what happened? Without question. What occurred was a consequence of deficient training in the use of cockpit equipment. The course he followed was nevertheless in absolutely precise accordance with readings from his piloting and navigation system and navigational computations.

Why did the command post navigator not intervene? Because as required by the guidelines regulating flight safety procedures, he remained at his own operational position throughout the flight. But he was unable to monitor the radar screen to check the accuracy with which the pilot was maintaining his course and thus in a timely manner to transmit necessary corrections to the aircraft because the command post had not been given control of the aircraft.

Those attending the critique heard analysis of other types of pilot error associated with the use of their equipment. The question may arise of whether it is really necessary to give so much time to training for situations in which equipment fails. It is in fact becoming increasingly reliable. But I think this kind of training is very necessary and useful. We are, after all, training for combat. And in a combat situation the probability that equipment will fail will be higher. That is why we have to train our flight personnel to function proficiently and confidently under any, even the most difficult, conditions.

As has been stressed, automatic navigation systems in combination with SAU [automatic control systems] have increased air navigational accuracy along a given route as well as the accuracy with which an aircraft approaches a specific point, eased the work load on a pilot on the stabilized legs of a flight and substantially improved the accuracy characteristics of tactical flight performance. By having introduced certain complications, however, these same systems have imposed new requirements upon procedures involved in training and preparing for a flight as well as in the actual execution of it. In what do these consist?

The preparation of flight personnel for a flight now takes more time: the process of entering data into the on-board computer requires absolutely accurate mathematical calculations. The attention and energy given on the ground, however, are recouped a hundredfold in the air; they are compensated, if we can express it in these terms, by the end results of the mission involved.

A pilot is now considered prepared to execute a flight mission if he knows by heart his mission and associated navigational plan, which has been duplicated on his knee board. He has only to glance at it quickly to check the correspondence between his computations and the true data on the location of his aircraft. This preparation permits timely identification of the slightest indication of the output of erroneous signals and the avoidance of possible errors in problems solved by the digital computer. This period of training and preparation requires that we develop in the pilot the solid skills he will need for flights executed entirely in the automatic mode: en route, in tactical combat situations, on the return flight to his air base and on the landing approach and right up to the alignment point. However, the pilot must be able to change over at any time to control of the aircraft without the use of his automatic navigation systems. Most effective for this purpose are the integrated simulators (KTS), on which all anticipated tactical situations are gamed under the direction of experienced commanders and instructors, and particularly thoroughly in the case of new or the most difficult tasks.

The KTS has special simulators which can be used to reproduce a navigational situation approximating the actual situation to the maximum extent possible. This is possible with flights in combat training aircraft as well, which assume a vital practical importance. So in addition to theoretical checks of pilot readiness, we need as well to make increasingly extensive use of combat training aircraft and other equipment.

This is precisely the way flight navigational training has been organized in the regiment commanded by Colonel V. Suvorov, military pilot 1st class. Aviator training here is structured such that personnel undergo most of their instruction in flights.

The principle which has it that "commanders will instruct their own men" has become the norm in this and most other units (chast'). To set up a program of navigational training for aviators and then to insure that it is well organized and supported is the duty and responsibility above all of unit and subunit (podrazdeleniye) navigators. Where this requirement is fully satisfied is where we will find the best-quality aviator combat training and the highest combat tactical effectiveness. Unfortunately, however, we have yet to remedy the last of the deficiencies in our navigational training program. In practical flight experience we will occasionally see instances in which overconfidence and negligence lead to errors.

The flight of Captain A. Zinov'yev, military pilot 1st class, had taken off on a routine training exercise. When they deviated from their course, these aviators were forced to land at another air base near theirs. The reason? Thorough analysis established that it was due to carelessness in the adjustment of an automatic radio compass (a 10-degree error). The difference between the approach headings of these two air bases also just happened to be 10 degrees.

This case is in itself not typical of flight practice, of course; in fact, we could say it is something of a rarity. But how typically we see here everything we have been talking about. When you remind experienced aviators, men with long periods of service behind them, about what they refer to as trivia, you will sometimes get the response: these are all commonplaces; is it really worth even talking about them? But then when their errors are critiqued, these comrades remain shamefacedly silent.

There are no trivialities in aviation. And it is better to repeat something everybody already knows one time too many than to disregard it altogether. For we should know that we will sometimes have to pay very dearly for our arrogance.

Low-altitude flight imposes particularly rigorous requirements upon navigational training for pilots of single-seat aircraft. Errors in calculations or failure to maintain course, speed or roll angle in turns will inevitably lead to deviation from assigned track and will make it impossible accurately to approach a designated point and attack a target.

The commander bears the primary responsibility for insuring that each crew receives timely and high-quality flight training. He trains and instructs his subordinates. Success depends to a great extent, if not entirely, upon his ability in a well-thought-out manner to plan, organize and provide the requisite support for a program of aviator combat training. He must always be rigorously exacting with all aviators, but especially with those who, after they get some experience under their belts, show an inclination to rest on their laurels and an uncritical attitude toward their own personal training and preparation.

The summer training period is now in full swing. Our aviators are striving within the shortest possible periods of time to attain the peaks of professional proficiency. Close and continuous supervision of flight navigational training exercised by commanders and senior officers will guarantee high-quality performance in the execution of flight missions under the most difficult of conditions.

It goes without saying, however, that to plan, organize and support a program of combat training in accordance with guideline provisions, competently analyze successes and errors in the performance of flight personnel and effectively raise the level of navigational training requires that commanders and senior navigators themselves be in an excellent state of combat flight training, possess solid methodological skills and pedagogical knowledge and exhibit self-control, stamina and tact. It will otherwise be impossible successfully to accomplish the complex and broad-ranging tasks involved in increasing the combat readiness of our units and subunits and insuring flight safety from a navigational point of view.

Units and subunits also organize a program involving aviators in independent preparation to help them develop a thorough understanding of the flight mission. After receiving his tactical assignment, the combat aviator must first of all undertake a thorough analysis of the nature of his target and then determine the methods to be employed in getting his aircraft into a zone in which the target can be reliably detected, identified and then attacked and the necessary flight safety measures: estimated altitude at which to approach the target and methods of maintaining it, methods of instrument monitoring the employment of weapons so as to preclude inaccurate releases or launches, disengagement from the attack etc.

So as not to lose a minute of the precious time devoted to independent preparation, the commander and navigator must be creative as well as purposeful in organizing this time. This they achieve through well-coordinated joint efforts, an understanding on the part of the commander of the place and role of navigational preparation, well-planned and efficiently organized drills, attentive individual monitoring of crew readiness and thorough analysis of flight results. Independent individual navigational preparation should play one of the most important roles. The well-known principle: "no navigation, no aviation" not only has not lost its value for our day, it has acquired a new, much more profound significance. We can say boldly that the quality of our preliminary preparations depends to a great extent upon the thoroughness with which an aviator has mastered his navigational skills and his piloting, navigation and sighting systems.

Inspired by the decisions of the 26th CPSU Congress, our aviators have undertaken heavy socialist obligations. Commanders, political personnel and party and Komsomol organizations must be more objective and thorough in their analysis of everything our aviators achieve in their effort to improve the state of their navigational training, strive to bring their mastery of tactical combat skills up to the highest possible level and instil a sense of personal responsibility in each man for exemplary performance of military duties, performance in line with requirements contained in guiding documentation.

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AIR FORCES

OFFICER TRAINING AT BARNAUL PILOT TRAINING SCHOOL

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 7, 1981 (signed to press 2 Jun 81)
pp 28-29

[Article by Colonel A. Serazhim, military pilot 1st class: "The Path to Independence"]

[Text] The graduation of lieutenants is a ceremonious event in the life of this pilot training school, the end result of strenuous labors on the part of its commanders, political personnel, instructors and flight-instructor, engineering and technical staff. Having completed their formal schooling, the new aviators go out to take their places in the ranks of the motherland's defenders in the air. The kind of training they have received in the school will to a great extent determine the time required for them to be able to go on duty and, accordingly, the level of combat readiness of their units (chast') and subunits (podrazdeleniye).

Improvement of the forms and methods of student training and education in this connection as well as of the teaching skills of the instructional staff requires continuous and unflagging attention. The difficulty involved here consists in the fact that teaching is a creative process that suffers from mindless, unimaginative routine, formalism, stagnation and inertia. Here as nowhere else must we take into account both objective and subjective factors, respond quickly to any change in them, study thorough the personality traits of the student and skillfully exercise an influence upon the young person to the end of developing in him the best of human qualities. Every teacher, regardless of his position, must of course have a deep sense of personal responsibility for the fruits of his labors.

As practical experience demonstrates, creativity in the training process would be unthinkable without well-thought-out plans. Our Barnaul Higher Military Pilot Training School imeni Chief Marshal of Aviation K. A. Vershinin each year draws up an integrated plan for communist student instruction for the entire period of training indicating the program and objectives for each course. It also outlines the measures to be taken by training subunit commanders, political personnel, flight-training section instructors and the party and Komsomol organizations. On the basis of this long-range plan, our subunits then plan their training programs in detail with reference to specific timetables and departments.

When they first arrive at flight school, most new students have no real conception of what flying and flight training is really all about. But when a young man develops a thorough understanding of what his mission is, he begins to put maximum effort into his studies. So from the very beginning we try to instill in our entering students a

pride in their chosen vocation so that they will see that their choice has not been misguided. Even while they are still undergoing their physical examinations and taking tests, these young people hear lectures on the history of aviation and participate in discussions on the celebrated exploits of aviators in both war and peace. Especially popular with these youngsters is the film about our school entitled "Vysota" [Altitude], which we made in accordance with a specially developed scenario. New students are then familiarized with the classrooms, auditoriums and laboratories in which they will be developing their understanding of the complex and interesting aviation sciences.

Thoroughly thought-out preparatory work will to a great extent predetermine the success of later student training.

One of the most important factors arousing a striving to master the vocation is the development of an interest in it, the instilling in young people of a sense of professional pride. It would be difficult to overestimate the importance of the educational role played by contacts between students and combat aviators who flew during the Great Patriotic War. A meeting with P. Plotnikov, a famous pilot and twice-honored Hero of the Soviet Union, whose bust has been put up on one of Barnaul's squares, Hero of the Soviet Union G. Novikov and Heroes of the Soviet Union, USSR Pilot-Cosmonauts G. Titov and V. Lazarev, for example, have been long remembered.

Taking the military oath at a memorial to soldiers from the Altay region who fell in battles for the motherland has become a notable tradition. Party veterans and representatives of local party and social organizations speak to the students here. These young people experience a tremendous upsurge of patriotic feeling; their hearts fill with pride in their Soviet motherland and her Armed Forces, an integral component of which is her Air Force.

The school's command and political section devote a great deal of attention to patriotic activities in the city schools. Students going home on leave are under the obligation to speak before their draft-age friends. They tell their peers about the school and their vocation. It is a pleasure to take note of the fact that when they appear before the selection board, prospective new students frequently declare that their decision to enter flight school was directly influenced by a meeting with a student who had come home. This is only one of the forms of our multifaceted military-patriotic and propagandistic effort. Its importance could not be overestimated.

Students encounter many difficulties at the very beginning of their training. One of them is their inability to work independently on a subject, write a piece for oral presentation, prepare a summary and to use reference material. But our teachers help them. Departments of the flight-training section have developed and put out special manuals on methods to be employed in presentation of the initial series of lectures. These manuals provide instructors with recommendations concerning instructional procedures and advice on what to focus the students' attention upon, what to give as dictation, what to work on during periods of independent preparation for lectures and how to make notes in the class notebook.

To become competent in the preparation of summaries of particular topics is by no means an easy thing. Unfortunately, this work is occasionally reduced to copying material from books, newspapers, magazines and reference books. It gives the appearance of being effective, because it fills up a lot of paper. But if I might be permitted to say so, that there is any benefit to be derived from the preparation of this

kind of summary is highly doubtful. This approach leads inevitably to formalism and a perfunctory attitude to the subject of study and stifles creativity. I would clearly not be mistaken if I said that summaries of substantial, meaningful content and which make sense are the result of great creative effort, in the process of which the person putting forth this effort develops and reinforces qualities any combat aviator must have, qualities such as persistence, goal-orientation and an ability to extract from an abundance of information that which is most important and essential to the solution of a specific problem and to set his ideas out on paper in a concise, well-argued manner. As experience has demonstrated, the students capable of properly summarizing material are the ones whose scientific work is of the highest quality and who write the best reports and do the best laboratory research. Teaching young students to prepare summaries [konspekty] constitutes only one, but a very important, link in the chain of interrelationships between training and instruction [obucheniye] and education and personal development [vospitaniye].

The methods exercises conducted prior to the beginning of training have been a great help to students in developing the skills and habits required for working independently on supplementary material. The school has made these exercises a regular practice for the past several years now. Students are familiarized with CPSU Central Committee requirements covering the study of the social and specialized sciences and with the technique of listening to and taking notes on lecture material. Display stands have been set up in the Marxism-Leninism room presenting model summaries clearly illustrating how one should begin work on a book.

After developing some basic habits and skills, the students begin the phase in which they work independently on the preparation of summaries of the works of V. I. Lenin. Instructors then critique these summaries and in the course of group instruction go over both the positive aspects and the deficiencies of the students' work. Communists in the Marxism-Leninism department, headed by Colonel M. Yermol'chik, came out as the initiators of this method.

In the process of preparing summaries of works of the classics of Marxism-Leninism, students develop an acquaintance with the rich world of the ideological and theoretical legacy of the founders of the communist world view and a desire and interest in pursuing a thoroughgoing study of these works. The school thus lays a solid foundation for continued ideological growth and development on the part of our future officers. The technique of working independently with literature proves to be of good assistance in mastering other disciplines.

The school's council concerns itself continuously with problems associated with efforts to improve the training and educational process and methods of student theoretical and practical instruction, where questions concerning independent work are always seen as being of paramount importance. Without this it would hardly be possible to anticipate any thorough and timely mastery of the training program as a whole.

A method of problem-oriented training has now positively moved into the leading position in the training process. We thus see the students' work, carried on under the direction of Lieutenant Colonel-Engineers L. Yevstaf'yev and Ye. Endeki, marked by thoroughgoing, exhaustive analysis and dealing with a number of critical problems. In the process, these young aviators work for the most part independently. Instructors assign them specific problems, and they are to come up with the answers on their own. This approach calls forth a great deal of energetic effort on the part of the students and arouses in them a desire to research and investigate.

The course of their practical flight training sees students develop and reinforce the habits and skills of working independently. Their teachers do not simply at this point pass the baton, as it were, to the flight instructors, but work in close contact with them as well. Joint efforts at the very beginning have become a law, a norm, at the school. What does this amount to? Primarily to helping students and pilots develop an understanding of the essential physical nature of one phenomenon or another and of other questions as well. Colonel-Engineer Ya. Maykher, for example, has helped flight instructors Major A. Zakhlebnyy, Captain V. Molokanov and Senior Lieutenant S. Starikov provide sound explanations of a number of special questions in the course of critiquing student flights. And then on one occasion, Colonel-Engineer N. Sal'nikov turned his attention to the fact that the analysis of power plant limitations provided by some of the pilots was not being presented in an adequately well-organized, well-argued manner. So after consulting with the unit commander, this officer conducted a session of instruction which he did not end until he was sure all his listeners had been able to develop a thorough understanding of this problem.

Flight instructor staff are assigned the primary role during the flight phase, however. It is precisely this group of trainers and educators who at this point lay the foundations for later mastery of flying skills and develop the necessary fighting qualities in the students. I recall the time when in the course of one of his programs student O. Nilogov made a number of errors in executing his approach and calculating his landing. The school council raised the question of whether he should not be reassigned for failure to make progress in his flight training. But Senior Lieutenant V. Kharitonov, a combat flight instructor 2d class, insisted that it give him time to master his flight program and assured the command that his student would solo.

So the officer set about analyzing his student's skills and level of theoretical knowledge and then drew up a training plan taking his individual qualities into account. Kharitonov devoted a great deal of time to drills and exercises and did not allow the least error or inaccuracy in his student's performance escape his attention. His labors were not in vain. Nilogov completed the flight program successfully. And this is no isolated case. The school has no small number of officers who love their profession and are selflessly devoted to it; the entire collective is rightly proud of them.

From line units regularly come reports and comments on our graduates. We are pleased to hear of their success. We have no doubt that the knowledge and skills acquired during their student years provide a solid foundation for professional development. Commanders, political personnel, professors, teachers and flight instructors are striving to devote their every effort, their experience and their teaching skills to this objective of great national importance--the training of pilots for our valiant Air Force.

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AIR FORCES

CAUSES OF AIR INCIDENTS EXPLORED

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pp 36-37

[Article by Major B. Makarevich: "A Deal with Conscience, Analyzing an Incident"]

[Text] As I was looking through the error and flight incident log, I came across officer Yu. Zverev's name in the "Personnel responsible" column. I confess, this left me somewhat puzzled. I'll tell you why. In his flight training regiment I had heard nothing but positive reports about pilot Zverev. Everybody I had spoken to had characterized him as a man with an excellent mastery of piloting procedures and techniques and of the tactical employment of his supersonic missile-carrying aircraft as well as a skilled instructor and methods expert. And now suddenly he's responsible for a flight incident. But after a look at the scheduling chart for the preceding flight shift, it also turned out that at the time the incident occurred, Zverev was not flying. In a word, there was every good reason to wonder.

But everything gradually began to fall into place. Officer Zverev had taken off that day with another pilot in one of the two-seat trainers for a weather reconnaissance flight. The crew executed its mission successfully. After they landed, the commander decided to deploy the brake parachute to shorten the landing run, but it did not deploy. After taxiing their combat trainer to its assigned spot, these combat pilots hurried immediately to tend to other responsibilities. And the trainer's technician set about immediately to prepare the aircraft for its next flight.

A short time later the aircraft again lifted off into the air. A student and his flight instructor were piloting the trainer this time. But they now found themselves in a difficult situation: after they had taken off and climbed to an altitude of 50 meters, the brake parachute deployed.

My purpose here is not to analyze this case from a purely technical point of view. We are talking about something else here--shortcomings in the official relationship between superior and subordinate in the course of a flight mission. It is precisely they which are occasionally the main cause of an incident.

Guideline documentation imposes clear and unambiguous responsibilities upon all military personnel participating in and supporting a flight mission. They provide that a pilot must inform an aircraft technician of the performance during a mission of the aircraft's various systems, instruments and units. In not reporting the incident involving the parachute, officer Zverev made a serious mistake. But I think that in an

appropriate column in the log next to the name of the pilot should have been entered the name of the person responsible for taking care of the aircraft. Because the first thing a technician receiving an aircraft back from a flight is supposed to do is ask the pilot if he has any comments. And in this case he didn't do it.

Now the official relationships prevailing between combat aviators and their assistants on the ground have long since been established in aviation; they have acquired the force of law, a law whose immutability has been confirmed by life itself. The example we have just looked at is just another demonstration of the truth of the statement that any violation entails undesirable consequences. And particularly intolerable are departures from established procedures by those who have been entrusted with the mission of training and instructing our young aviators.

While by no means excusing officer Zverev, we can easily imagine how he might have had other things on his mind after he landed, and it is possible that he quite simply forgot to report that the brake parachute had not deployed. But while the one was remembering one thing, the other should have been doubly alert--the trainer's technician in this instance. But as his comrades told me, he had on previous occasions forgotten to ask the question required when receiving an aircraft: "May I have your comments?" For a time, though, this had no negative effect on his work. But the deal he had thus struck with his conscience ultimately led to trouble.

At air bases of our schools and line units we might see the following happen, for example. A pilot or flight instructor will come up to an aircraft or helicopter and sign the check list book without saying anything--the sooner to be able to get into the cockpit. At best he would only ask if everything is in order. But regulations require a technician's report in specified form and then an inspection of an aircraft or helicopter over a specified route. Only then may a crew commander sign a check list.

One violation of established regulations leads to another. No problems. Later on there are more; the problem is that not just one person has taken an open stride down the path of violations, but that this person has also set a bad example for his subordinates.

One time I saw a flight instructor reprimanding a student precisely because he was very attentively inspecting his combat trainer aircraft prior to takeoff. First the instructor impatiently looked at his watch as if to tell this future officer to hurry it up. But then when that didn't seem to get the message across the instructor said sharply: "What are you looking for there? Don't you trust the technician?"

I imagine these two statements are worth some comment. It is indeed possible that the student was taking a little too long and that the instructor really should have tried to get him to work more quickly. But we cannot speed up an inspection by deliberately pushing a subordinate to violate established procedures. It will be a bad thing if a future pilot absorbs this kind of "knowledge."

At this point, I recall, the student, now somewhat disconcerted, moved quickly to take his place in the cockpit. And the aircraft technician? Apparently flattered by this unwittingly expressed commendation, he modestly held his tongue, as they say, saying nothing to contradict the commander. But this kind of behavior serves no purpose: he should have tactfully reminded the flight instructor that this beginning

combat aviator was proceeding in an absolutely proper manner--and that there was plenty of time left before the flight. Incidentally, even if time is running short, no one has the right to take a perfunctory attitude toward the inspection of aviation equipment.

I have more than once heard former aviators talk about comrades in their old combat formations. I don't remember any words of disapproval directed toward those who in all situations unfailingly adhered to both the spirit and the letter of regulations governing flight safety and maintenance operations. I think it could be taken as a principle that the special nature of the work in aviation assumes a continuous combination of confidence with verification, comradeship with highly efficient personal performance and exactingness toward both oneself and others.

Commanders, staff officers, political personnel, senior personnel of the aviation engineering service and party and Komsomol activists are actively engaged in an effort to establish and maintain the kind of relationships between flight and technical and engineering personnel that are in fact prescribed by regulations. But it would be no mistake to say, however, that an important role in this effort falls to the technicians and their immediate superiors, the steadfastness of their character and their adherence to principle in practical matters both great and small. Senior Technical Services Lieutenant A. Kalinin, the chief of the flight maintenance section under whom I served for a long time, showed us a good example of just this kind of performance in discharging official responsibilities. Whether he was assigning tasks, critiquing us or talking to us and supporting his own views with both positive and negative examples from his own experience, he would always remind us of the need to be punctual and stand on principle.

There was a pilot officer named Yu. Usikov in our squadron. His high level of professional skill, his ability to approach people and other positive qualities had his comrades-in-arms well-disposed toward him. For a time, this apparently dulled my vigilance, too, and once forced me into a compromise with my conscience.

Usikov had returned from a flight. As was required in this situation, I asked him: "May I have your comments?"

The pilot slowly removed his protective helmet and gloves and glanced over the instruments and panels in the cockpit. Then a stern expression unexpectedly came over his face. Directing my attention with a nod of his head to one of the circuit breakers, he asked: "Why wasn't the barospeedograph switched on?"

Now I had the sequence of cockpit equipment procedures involved in preparing an aircraft for a flight down cold. I well knew that in getting Usikov ready for his mission I had switched that circuit breaker on. But meantime, it was in fact in the "Off" position. Seeing that I was disturbed by the situation, the pilot said quietly: "Maybe I accidentally switched it off myself. This'll just be between us. Don't worry...."

Officer Usikov was then flying within the zone. I had heard earlier that he would sometimes alter his mission on his own. So what he said should have alerted me, and I should have immediately reported through channels what had happened. The thing that was keeping me from doing the only proper thing in this situation was the thought: I'll be putting a man who confided his secret to me in a dangerous position. So after I thought about it, I decided to take the blame myself.

I should add that Usikov didn't take any more liberties after that. He was promoted and transferred to a more difficult, more important flight assignment. He once admitted to me confidentially that after that particular flight he himself really began to worry about his own conduct.

Nevertheless, some time later I told Senior Technical Service Lieutenant A. Kalinin about what had happened. He listened quietly and attentively. Then he said to conclude our conversation:

"You didn't have the courage; you could have been the cause of a serious accident. Failure to remain within assigned flight modes itself contains hidden dangers. But that's not all. That aircraft was flying without monitoring or recording equipment. What if some kind of malfunction had developed but then remained undetected? It's hard to imagine how the next flight would have ended up."

His words clearly conveyed his concern for the safety of the mission with which we had been entrusted. It was impossible not to grasp what Kalinin was talking about. Later, when I was working in my flight-support assignments, I always tried to do exactly as required by the laws and regulations governing flight operations.

The matters of improving organization, tightening discipline and insuring adherence to regulation procedures were raised in a most pointed manner at the 26th CPSU Congress. All this naturally applies directly to us as military men and flight and technical and engineering personnel. In strict adherence to norms of conduct established in our regulations and other guiding documents is to be found important new potential for achieving greater flight safety.

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AIR FORCES

IMPORTANCE OF NAVIGATION TRAINING FOR HELICOPTER CADETS

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[Article by Lieutenant Colonel G. Chaplygin: "Not Leaving Anything to Chance, Continuous Attention to Flight Safety"]

[Text] It's summer now, a period of intensive training. From early in the morning until late in the evening the sky above the air base is filled with the roar of helicopter turbines: student flights are under way. Our young aviators are mastering their flight-training exercises and improving their navigational skills. But even before they began their flight program they had demonstrated good knowledge and had learned to prepare flight maps and perform navigational computations. So now, when the center of their training activities has shifted to the airfield, all these skills are helping students improve their performance in the air.

Successful accomplishment of every flight mission depends upon many factors: the professional training and moral and psychological temper of the crew involved, undeviating adherence on the part of the crew to requirements imposed by guiding documents, reliably functioning equipment and weather conditions.

Every aviator strives to accomplish his assigned mission the best he can. But you'll nevertheless occasionally hear a student say he's studied everything, he knows everything and that he's been all over the flight zone. Conversations with statements like this are always alarming, since this kind of talk is, as a rule, the product of excessive self-confidence.

The fact is that our young aviators do indeed possess definite skills; the task is to improve them. But here is where we occasionally encounter a certain psychological barrier. One student, having developed a sense of confidence, will begin to overestimate his powers and knowledge. This has an impact upon his training and the preparations he makes for a flight. We have only to modify the situation ever so slightly and a student like this suddenly finds himself at a loss. I recall one particular instance in this connection.

You can't imagine a day with weather any better. But 15 minutes after passing the initial point of the course, student V. Martynyuk, a crew commander executing a cross-country, found himself no longer able to recognize the terrain. He became confused and, without reporting his temporary loss of orientation to the flight operations officer, attempted to reestablish it visually by arbitrarily altering the route of his

flight. It was only thanks to decisive and energetic measures on the part of the flight control group that Martynyuk was again able to function more effectively, approach his next turning point and then successfully and safely complete the flight.

In analyzing this instance, you come to the conclusion that in its work, the crew was not relying upon thorough knowledge and solid skills, or any ability to evaluate an air situation quickly, but rather was trusting to chance. They were simply flying along, simply looking to the side rather than continuously and attentively maintaining a detailed orientation, computing their course and keeping close track of mode, course and time.

Crew commander Sergeant A. Rad'ko and student navigator V. Kulikov performed no better on their cross-country flight. Soon after passing the starting point of their course, they found themselves unable to determine precisely which side their check reference point was on. After they landed their helicopter I asked Kulikov how it was possible that they would almost lose their way so near the airfield.

"Maintaining orientation in the air was my responsibility, but I was relying on the crew commander," the student replied. "Sergeant Rad'ko has a lot more experience and flight time than I do, and he's already made a number of cross-country flights over this area."

We should point out here that the quality of independent student cross-country flight performance depends to a great extent upon their flight instructors. It is worth looking at the following situation, for example: in the course of cross-country check flights, the instructor will give the young aviator the initiative, not neglecting, however, consistently and in the methodologically proper manner, to provide them with the navigational instruction they need. Over the course of the flight he will always be following the student's performance closely, correcting his mistakes. But he will do this in such a way that the student himself will actually be performing the manifold navigational tasks. This method has proven itself entirely. Future pilots mastering this program under the direction of instructors like this will always prepare carefully and thoroughly for each flight, perform efficiently and proficiently in the air and never find themselves confused by a changing situation.

Student Kulikov was not prepared for this kind of activity. So he was depending entirely upon the crew commander, Sergeant Rad'ko. He should have been able to perform his own responsibilities better so as to have been able at any moment to provide the commander with the information he needed.

But now what was Sergeant Rad'ko relying upon? He does have a certain amount of experience, that's true. But all skills require continuous reinforcement; theoretical knowledge has to be broadened and deepened; and all flight missions, even those which at first glance would appear the easiest, demand thorough preparation. This, it would appear, Rad'ko was not doing.

In analyzing other flights you come to the conclusion that the relative ease with which some courses can be flown engender in some students an in no way justifiable complacency and excessive self-confidence. They probably reason something like this: I'll be able to orient myself in the air somehow--after all, I know the terrain along the course. But in the meantime, the air is a harsh judge of any oversight. We can speak of the following law: any oversights on the ground, any carelessly modeled flight will invariably lead to errors in the air. The errors and deficiencies in

the performance of Sergeant Rad'ko's crew resulted from the fact that these students had poorly and incompletely prepared for their upcoming cross-country flight. They had not even found the time to make a detailed study of the starting point of their course, in consequence of which they mistook an entirely different reference point for their starting point.

I want now to recall how coolly and carefully Soviet pilots performed during the bitter years of the past war. We talked about this not long ago with Grigoriy Andreyevich Usov, a veteran of the Great Patriotic War and a former flight [zveno] commander, who was one of our school's first flight instructors in the 1940's. He told us about a flight he made in a U-2 to partisans behind the front line. The mission was urgent and critical. It was dark.

"I'm holding my heading, computing my course and piloting under the very edge of a low cloud," Grigoriy Andreyevich recalls. "Periodically I scan the ground. According to my calculations, I should be seeing a characteristic bend in the river. And there it was, exactly where it was supposed to be: I catch sight of the gray vaguely outlined below. The ground was pitch-black, but I could nevertheless catch the flickering highlights over the surface of the water. I knew our flying area like the back of my hand. That's how I was able to orient myself precisely by that bend in the river. And then it was only a short distance from the river to the airfield. I was approaching it precisely. I'm going to put the thing down coming straight in. But of course, nobody's expecting me at such a late hour. The problem was that now my fuel reserve didn't allow me the option of circling around again so they would light some landing fires on the airfield. There was only one thing left to do: to land the thing blind. Now here's where a knowledge of the reference landmarks for this airfield really came in handy. So I glide in, feeling my way along, as they say; I approach at only a slight angle so I won't bury myself in the ground. I figure: as soon as I feel the impact I'll freeze the stick. There's the ground racing past below me now on the airfield. I've frozen the control stick in my hands. My landing has been successful."

It's not often that a pilot has to make such "check flights." What was it that helped Usov on this particular occasion? Excellent knowledge of the terrain in the area, skill in handling his machine, accurate calculations and self-control.

Between a U-2 and one of today's helicopters there is a substantial difference, certainly. But regardless of how reliable a piece of equipment is, regardless of how sophisticated any instruments are, the laws governing flight operations remain immutable. Front-line experience is instructive for our young aviators from this point of view. Our future combat aviators are consistently improving their grasp of the secrets of mastering flight skills; each new flight sees them striving to master the next phase in a program leading to air combat proficiency. But effective, proficient performance in the air is possible only when an aviator has made a thorough study of their programmed exercises, when he knows the operational procedures involved and after he has demonstrated will power, persistence, industry and consistency of effort in a program of solid training in the classroom, in the simulator and in the cockpit of his helicopter.

The path to the skies begins on the ground--from the lecture hall and the training facility. Pilots should always remember this. The reliance on chance in the difficult and critical tasks associated with piloting an aircraft is a poor ally.

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